WHAT IS CLAIMED IS:

1. A pivotally oscillating structure including apparatus for adjusting a parameter of said pivotal oscillations, said structure comprising:

a support structure;

a device comprising a functional surface supported by a pair of torsional hinges for pivotally oscillating around said pair of torsional hinges, each one of said pair of torsional hinges extending from said functional surface to an anchor member, said anchor member attached to said support structure; and

apparatus coupled to said device for selectively adjusting the stress loading on said pair of torsional hinges to change a parameter of said pivotal oscillations.

2. The oscillating structure of claim 1 further comprising drive apparatus for causing said functional surface to pivotally oscillate about said torsional hinges.

3. The oscillating structure of claim 1 wherein said anchor member is a support frame mounted to said support structure.

4. The oscillating structure of claim 1 wherein said anchor member is a pair of support pads mounted to said support structure.

5. The oscillating structure of claim 1 wherein said apparatus for adjusting the stress loading on said pair of torsional hinges applies at least one of tension and compression forces to said pair of torsional hinges.

6. The oscillating structure of claim 2 wherein said apparatus for adjusting the stress loading on said pair of torsional hinges applies at least one of tension and compression forces to said pair of torsional hinges.

7. The oscillating structure of claim 6 wherein said apparatus for adjusting said stress loading is responsive to an electrical control signal.

8. The oscillating structure of claim 5 wherein said apparatus for adjusting is a piezoelectric element responsive to said electrical control signal.

9. The oscillating structure of claim 5 wherein said apparatus for adjusting is an electromagnetic device responsive to said electrical control signal.

10. The oscillating structure of claim 7 wherein said apparatus for adjusting is a piezoelectric element responsive to said electrical control signal.

11. The oscillating structure of claim 7 wherein said apparatus for adjusting is an electromagnetic device responsive to said electrical control signal.

12. The oscillating structure of claim 7 further comprising sensor apparatus for providing an electrical signal representative of a selected parameter of said pivotal oscillations of said functional surface.

13. The oscillating structure of claim 12 wherein said functional surface pivotally oscillates at the resonant frequency of said scanning device.

14. The oscillating structure of claim 13 further comprising control circuitry for receiving said electrical signal from said sensor apparatus and for providing said electrical control signal to adjust said stress loading so as to maintain said selected parameters between a selected minimum value and a selected maximum value.

15. The oscillating structure of claim 13 wherein said selected parameter is the scan velocity of said scanning structure.

16. The oscillating structure of claim 13 wherein said selected parameter is the resonant frequency of said scanning structure.

17. The oscillating structure of claim 12 wherein said sensor apparatus comprising a piezoelectric element.

18. The oscillating structure of claim 12 wherein said sensor apparatus comprises a piezoresistant element.

19. The oscillating structure of claim 12 wherein said sensor apparatus comprises a light source and one or more light intensity sensors arranged so that the intensity of light received at said one or more intensity sensors varies with the position of the oscillating mirror.

20. The oscillating structure of claim 13 wherein said functional surface of said scanning device is a reflective surface and further comprising a light source for directing light to said reflective surface such that said scanning device moves a beam of light according to a selected pattern.

21. The oscillating structure of claim 1 wherein said functional surface of said scanning device is a reflective surface and further comprising a light source for directing light to said reflective surface such that said scanning device moves a beam of light according to a selected pattern.

22. The oscillating structure of claim 21 wherein said scanning structure operates as the scanning device of a laser printer.

23. The oscillating structure of claim 20 wherein said scanning structure operates as the scanning device of a laser printer.

24. The oscillating structure of claim 20 wherein said scanning structure operates as a scanning device of a projection imaging system.

25. The oscillating structure of claim 1 wherein said device further comprises a second pair of torsional hinges for providing motion orthogonal to said pivoting motion.

26. A scanning device pivotally oscillating at its resonant frequency and including apparatus for maintaining said resonant frequency within a selected range, said scanning device comprising:

a support structure;

a reflective surface pivotally supported by a pair of torsional hinges, each hinge of said pair of torsional hinges extending from said reflective surface to an anchor member, said anchor member attached to said support structure;

apparatus coupled to said anchor member for applying at least one of tension and compression forces to said pair of torsional hinges in response to an electrical control signal;

a sensor for providing an electrical signal representative of a selected one of the parameters scan velocity and said resonant frequency of said oscillating mirror;

a control circuit for receiving said electrical signal from said sensor and for providing said electrical control signal to adjust said stress loading so as to maintain said selected parameter between a selected minimum value and a selected maximum value; and

a light source for directing light to said reflective surface such that said scanning device moves a beam of light back and forth across a target.

27. The scanning device of claim 26 further comprising circuitry for modulating said beam of light as it moves back and forth and a moving photosensitive medium for receiving and spacing successive modulated moving beams of light to form an image.

28. The scanning device of claim 26 further comprising circuitry for modulating said beam of light as it moves back and forth and apparatus for providing orthogonal motion to said moving beam of light such that successive modulated light beams combine to form an image.

29. The scanning device of claim 28 wherein said reflective surface further comprises a second pair of torsional hinges to provide said orthogonal motion.

30. The scanning device of claim 28 further comprising a second reflective surface for providing said orthogonal motion.

31. A method of adjusting a parameter of a pivotally oscillating structure having a functional surface comprising the steps of:

supporting a functional surface by a pair of torsional hinges extending between said functional surface and an anchor member such that said functional surface pivotally oscillates about said pair of torsional hinges;

mounting said anchor member to a support structure; and

adjusting the stress loading on said pair of torsional hinges to adjust a selected parameter of said pivotally oscillating structure.

32. The method of claim 31 further comprising the step of providing a drive force to pivotally oscillate said functional surface.

33. The method of claim 31 wherein said step of adjusting said stress loading comprises the step of applying at least one of tension and compressional forces to said pair of torsional hinges.

34. The method of claim 33 wherein said step of applying comprises the step of mounting a piezoelectrical element for applying said one of tension and compression forces to said pair of torsional hinges by providing electrical signals to distort said piezoelectric element.

35. The method of claim 31 further comprising the step of monitoring a selected parameter as said functional surface pivotally oscillates around said torsional hinges and providing a signal representative of said selected parameter.

36. The method of claim 34 further comprising the step of sensing a selected parameter as said functional surface pivotally oscillates around said torsional hinges and providing a signal representative of said selected parameter.

37. The method of claim 35 wherein said selected parameter is the resonant frequency of said functional surface pivotally oscillating around said torsional hinges.

38. The method of claim 35 wherein said selected parameter is the scan velocity of said functional surface pivotally oscillating around said torsional hinges.

39. The method of claim 36 further comprising the steps of receiving said signal representative of said sensed parameter, and generating said signals applied to said piezoelectric element so as to maintain the selected parameter of said pivotal oscillation of said scanning device between a selected minimum level and a selected maximum level.

40. The method of claim 31 wherein said selected parameter is the resonant frequency of said scanning device.

41. The method of claim 39 wherein said functional surface of said scanning structure is a reflective surface and further comprising the step of directing a beam of light on to said reflective surface to provide a scanning beam of light.

42. The method of claim 41 further comprising the steps of mounting said scanning structure in a printer for use as the scanning engine.

43. The method of claim 41 further comprising the step of mounting said scanning structure in a display device for use as the scanning engine.

44. The method of claim 41 further comprising the step of modulating said scanning beam of light and receiving said modulated scanning beam of light at a photosensitive target.

45. The method of claim 44 wherein said photosensitive target is a display screen and further comprising the step of moving said modulated beam of light orthogonal to said scanning motion to form an image on said display screen.

46. The method of claim 44 further comprising the step of moving said photosensitive target orthogonal to said scanning motion to form an image on said moving photosensitive target.